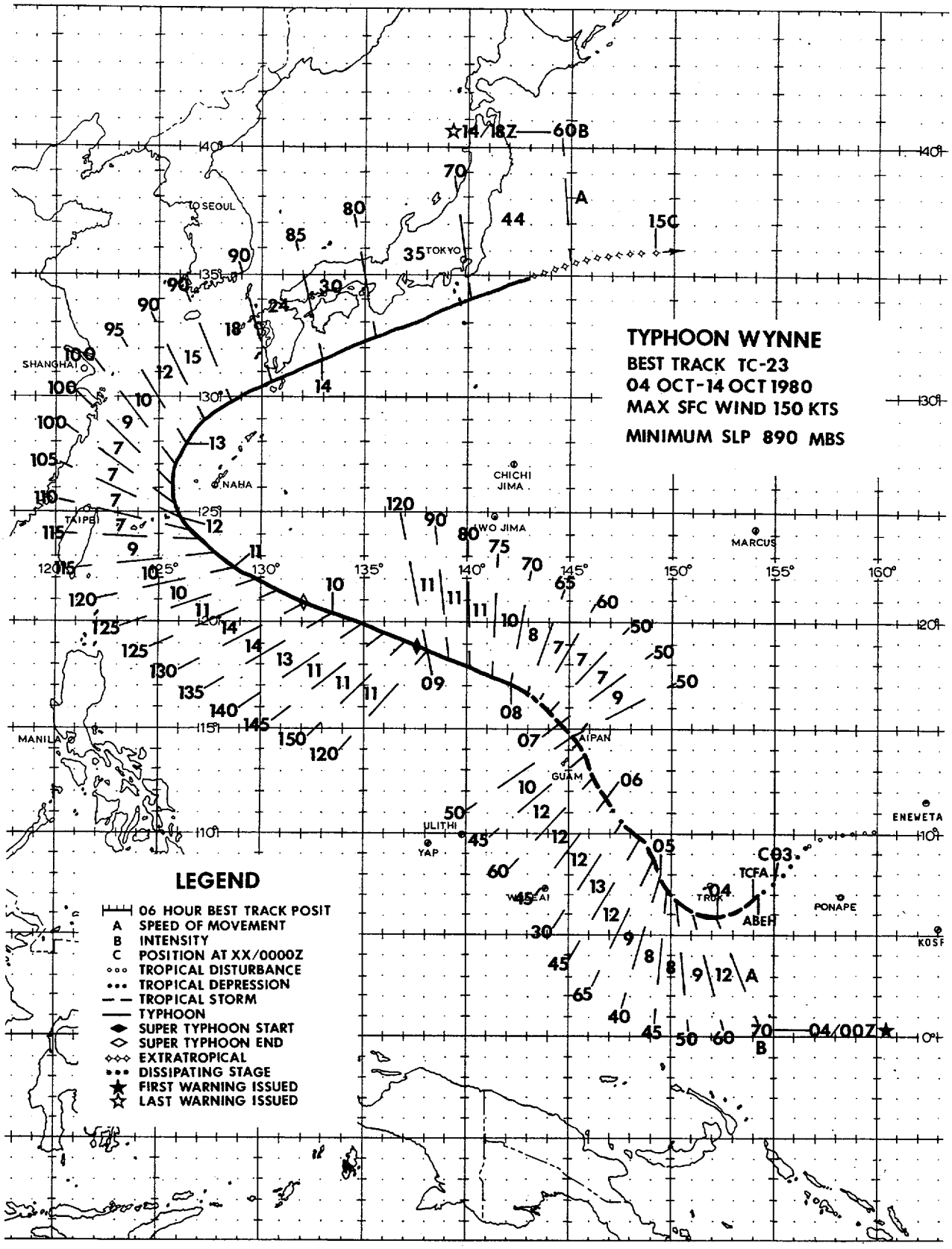
TYPHOON WYNNE
BEST TRACK TC-23
04 OCT-14 OCT 1980
MAX SFC WIND 150 KTS
MINIMUM SLP 890 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
☆14/18Z—60B
04/00Z★
TO SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
MANILA
CHICHI JIMA
IWO JIMA
MARCUS
SAIPAN
GUAM
YAP
ULITHI
WOLEAI
TRUK
ABEN
TCFA
PONAPE
ENEWETA
KOSR

The disturbance that eventually developed into Super Typhoon Wynne was evident on satellite imagery as early as 1800Z on 30 September, although at that time, it appeared to be simply enhanced convection embedded in the convergent inflow into Typhoon Vernon located 1000 nm (1852 km) to the northwest. By 020000Z October, however, the disturbance had separated from the inflow into Vernon, and by 021200Z, the convective activity had increased in organization with good curvature and upper-level outflow evident from satellite data.

The small scale of the disturbance and the tightness of the circulation that characterized Wynne during most of her life prevented the circulation from appearing on synoptic analyses and led to an underestimation of severity during her formative stage. These facts heavily influenced the decision to delay the issuance of a Tropical Cyclone Formation Alert for 21 hours, although post-analysis indicates that tropical storm strength was achieved as early as 030600Z.

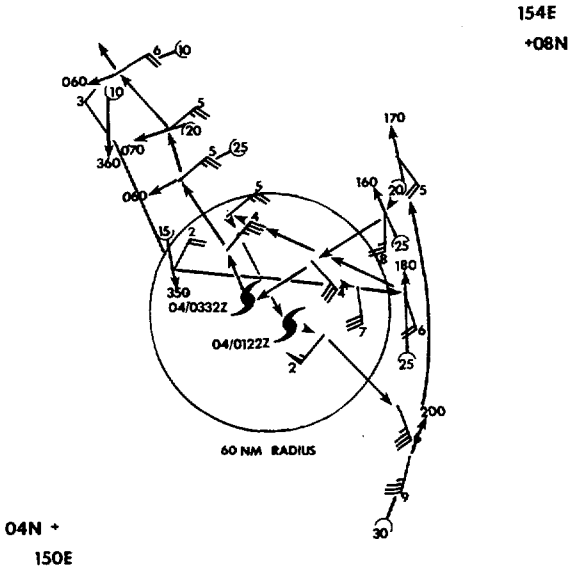

FIGURE 3-23-1. Plot of aircraft reconnaissance data for the 040122Z and 040332Z October 1980 fixes of Tropical Storm Wynne.

Because of her proximity to Guam, numerous aircraft reconnaissance missions were flown into the developing tropical cyclone. This extensive coverage confirmed Wynne's small circulation (Fig. 3-23-1 and 3-23-2) and permitted JTWC to monitor her development very closely.

Although Typhoon Lex may have been the most interesting cyclone of the year in terms of movement, Super Typhoon Wynne proved to be the most unusual in terms of intensity oscillations. As shown in Figure 3-23-3, Wynne's early stage of development was characterized by short periods of rapid intensification and weakening, rather than by a typical smooth, gradual intensification. From 3 October to 7 October, Wynne's intensity and convective activity fluctuated significantly, as she attained typhoon or near typhoon strength only to weaken to near tropical depression intensity three times following a diurnal cycle. Although not as marked as the oscillations in the observed maximum winds, the minimum sea level pressure also exhibited a cyclical oscillation that closely approximated the periodicity of the maximum winds.

There have been documented cases of tropical cyclones exhibiting intensity variations (Holliday, 1976). However, these occurrences were limited to well-developed typhoons with minimum sea level pressures below 970 mb and with a single weakening-reintensifying cycle.

An examination of the satellite imagery during this period of large short-term changes in intensity (Figure 3-23-4) reveals that maximum activity in deep convection occurred in the early morning hours (0700 to 0800 local time) with a minimum in the evening hours (1900 to 2000 local time). An increase in cirrus toward the late afternoon (1600 local time) was also evident. These observations agree with the findings of Arnold (1977). Although Arnold found no evidence of intensity change accompanying the change in cirrus or deep convection, significant intensity change was observed in the case of Wynne with a lag of 6 to 8 hours between maximum convective activity and maximum observed winds.

Wynne's third and final period of weakening occurred as she tracked 45 nm (83 km) northeast of Guam. This weakening, combined with her small circulation, resulted in Wynne having virtually no effect on Guam. Wynne continued to intensify rapidly following her third reintensification cycle at 071800Z, attaining super typhoon strength just 30 hours later and a peak intensity of 150 kt (77 m/sec) in another 6 hours. Figure 3-23-5 depicts Wynne near maximum intensity about 490 nm (908 km) southeast of Okinawa. Minimum sea level pressure (MSLP) during this 35-hour period dropped from 982 mb to 890 mb - a 31 mb/12 hr fall.

JTWC's Theta E (θ_e)/MSLP study once again accurately predicted this explosive deepening as the θ_e and MSLP trace intersected at 081400Z. Wynne's intensity peaked 16 hours after the time of intersection with the surface winds increasing by 85 kt (44 m/sec) and the MSLP falling another 62 mb.

As Wynne tracked north-northwestward past Guam, she was expected to move through

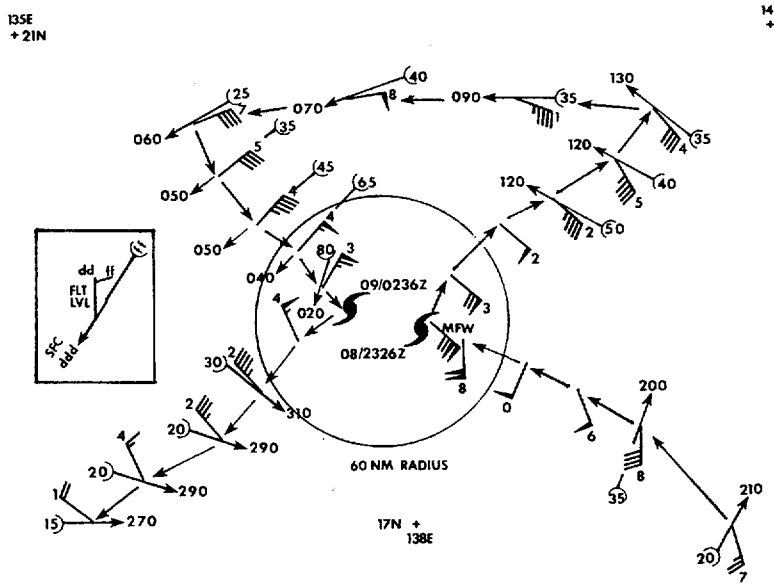

FIGURE 3-23-2. Plot of aircraft reconnaissance data for the 0823262 and 0902362 October 1980 fixes of Typhoon Wynne.

an apparent weakness in the subtropical ridge north of Guam. However, the weakness between 25N and 30N was evidently too far north to permit her to break through the ridge, and she eventually came under the influence of the strong anticyclone located between Okinawa and the Bonin Islands. Post-analysis of available 500-mb data indicates that a change to a more westward forecast track around the southern periphery of the anticyclone could have been made 24 hr earlier. Once the forecast track was changed to reflect the shift in the synoptic flow pattern to a more definitive easterly steering current, JTWC was consistent in accurately predicting recurvature just west of Okinawa. Wynne actually recurved 100 nm (185 km) west of Okinawa, and her slow 7 kt (4 m/sec) bend around the island brought over two days of torrential rain and winds gusting to more than 65 kt (33 m/sec). Very few injuries were reported with farm crops receiving the major wind damage. A small island 30 nm (56 km) northwest of Okinawa and closer to Wynne's path, however, reported winds of 100 kt (51 m/sec) and severe damage.

Once north of the ridge axis, Wynne tracked virtually straight east-northeastward on a heading of 070 degrees. This course kept her approximately 80 nm (148 km) from the coast of Japan. Thirty (15 m/sec) to forty-five kt (23 m/sec) winds were reported by Japanese coastal stations as Wynne accelerated northeastward. Heavy rains claimed several lives and flooded over a thousand homes.

As Wynne accelerated past Japan at speeds exceeding 40 kt (74 km/hr), the vertical wind shear and the influx of cooler, drier air resulted in rapid extratropical transition. A reconnaissance aircraft at 141500Z was unable to find a circulation at 700 mb and satellite imagery at 141800Z revealed no active convection. The remnants of Wynne eventually were absorbed by a developing low pressure system east of Japan.

FIGURES 3-23-3 and 3-23-4 are on the following pages

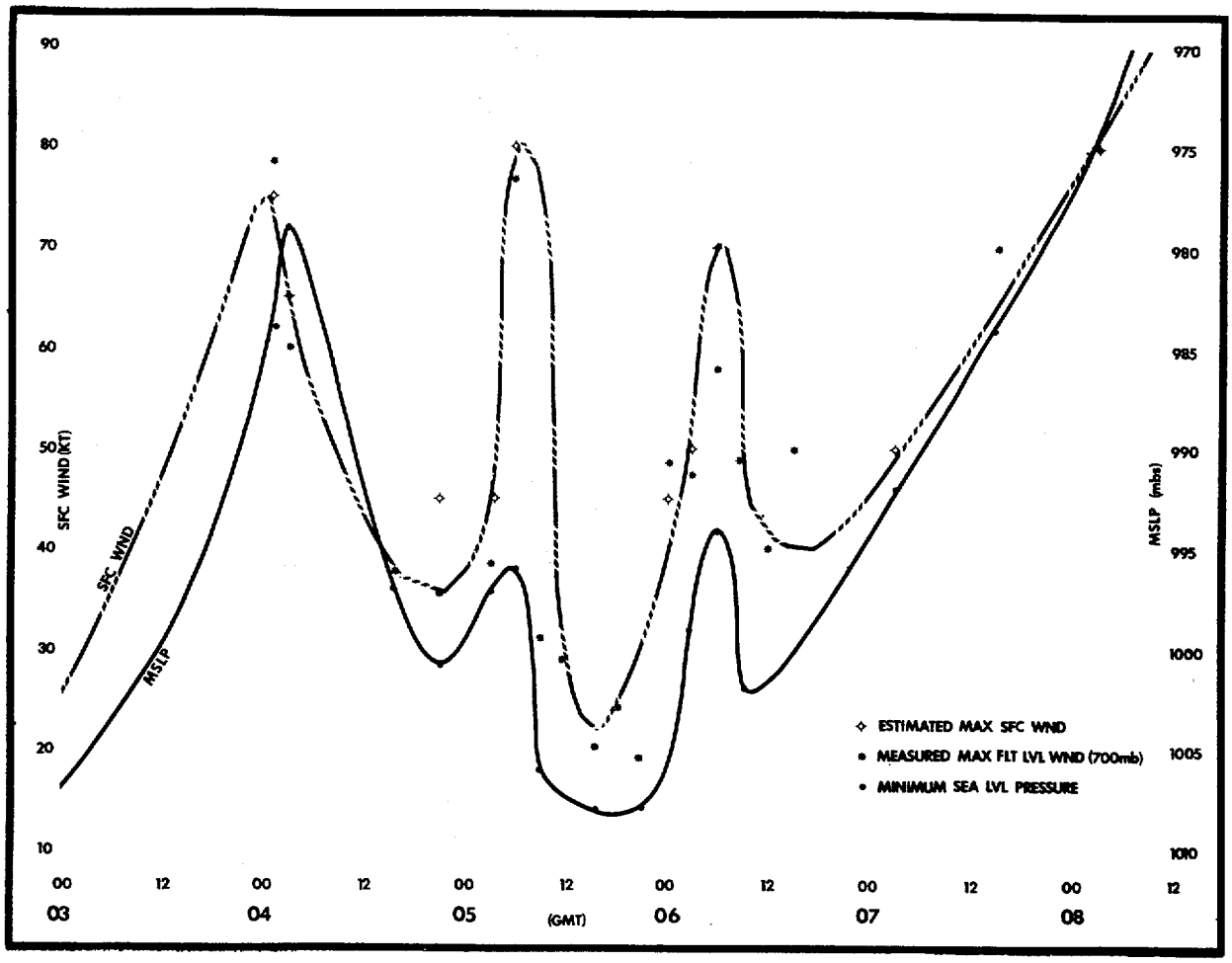

FIGURE 3-23-3. *Smoothed traces of Wynne's maximum wind speed and minimum sea level pressure versus time for the period 3-9 October 1980.*

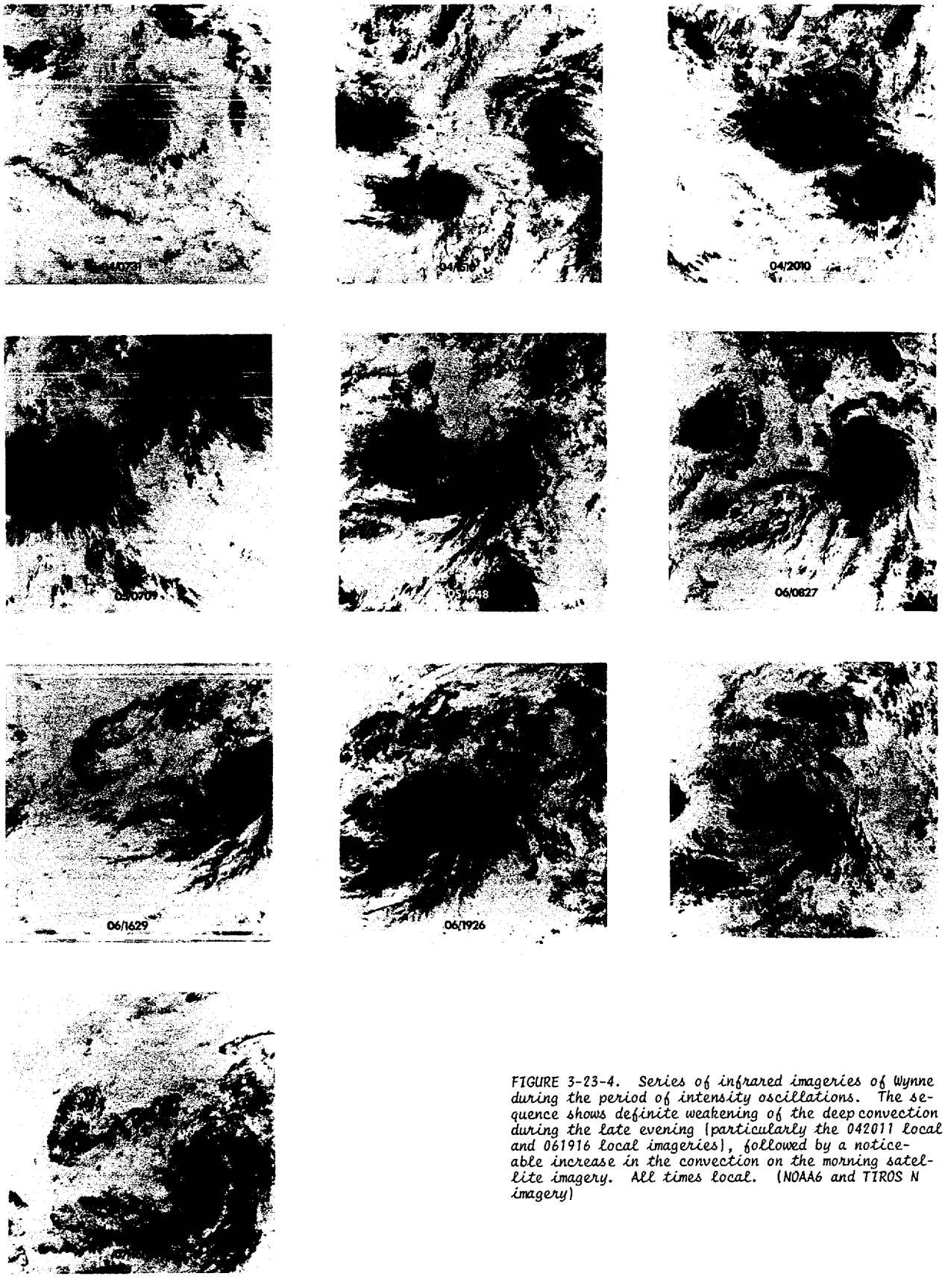

FIGURE 3-23-4. Series of infrared imageries of Wynne during the period of intensity oscillations. The sequence shows definite weakening of the deep convection during the late evening (particularly the 042011 local and 061916 local imageries), followed by a noticeable increase in the convection on the morning satellite imagery. All times local. (NOAA6 and TIROS N imagery)

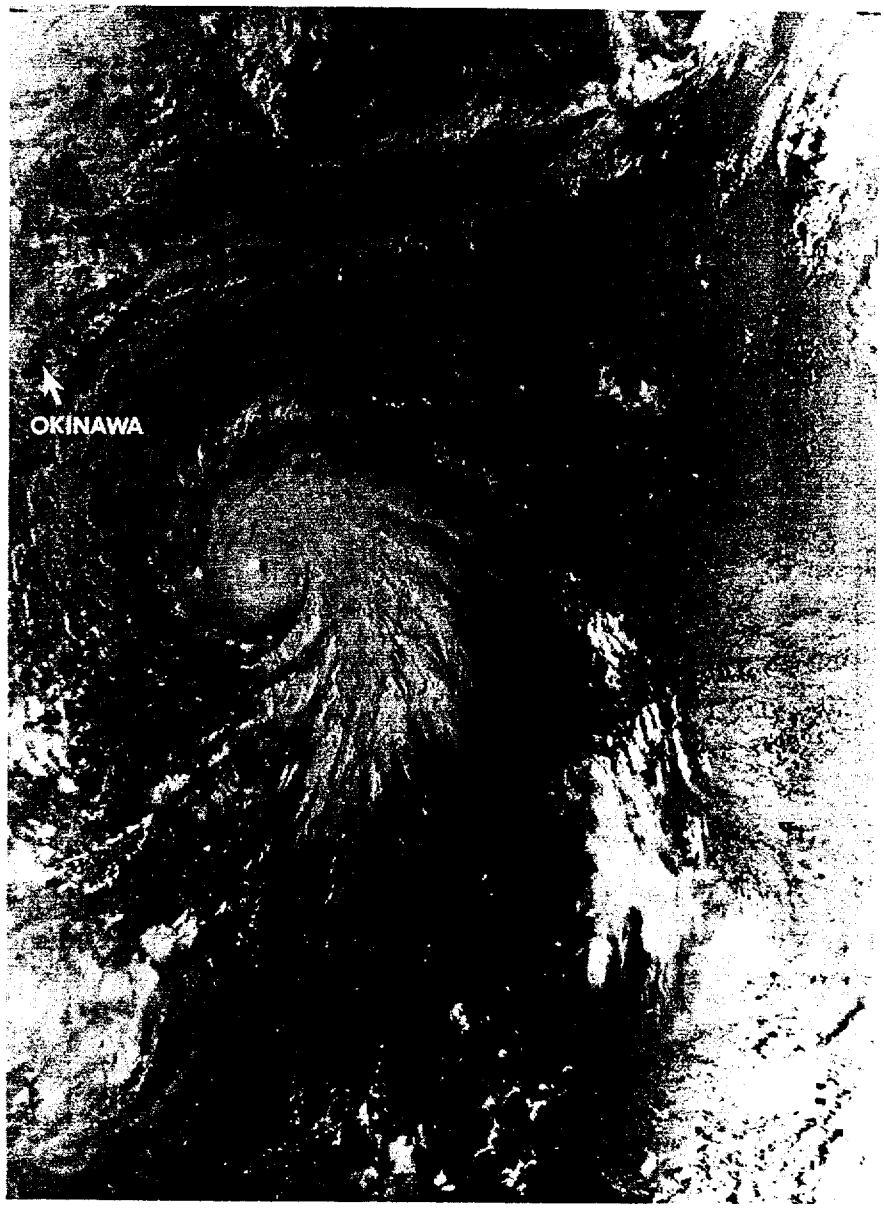

FIGURE 3-23-5. *Super Typhoon Wynne near maximum intensity 490 nm (907 km) southeast of Okinawa and 730 nm (1352 km) northwest of Guam, 9 October 1980, 2240Z. (NOAA6 imagery)*